www.egi.eu
@EGI_eInfra

Compute & storage integration

Enol Fernández
enol.fernandez@egi.eu

The work of the EGI Foundation
is partly funded by the European Commission under H2020 Framework Programme

https://www.egi.eu/services/

EGI Service Catalogue

Compute

Cloud Compute
Run virtual machines on demand with complete control over computing resources

Cloud Container Compute
Run Docker containers in a lightweight virtualised environment

High-Throughput Compute
Execute thousands of computational tasks to analyse large datasets

Workload Manager
Manage computing workloads in an efficient way

Storage and Data

Online Storage
Store, share and access your files and their metadata on a global scale

Data Transfer
Transfer large sets of data from one place to another

DataHub
Access key scientific datasets in a scalable way

Security

Check-in
Login with your own credentials

Applications

Applications on Demand
Share online applications for your data and compute-intensive research

Notebooks
Create interactive documents with live code, visualisations and text

Training

FitSM Training
Learn how to manage IT services with a pragmatic and lightweight standard

ISO 27001 Training
Learn how to manage and secure information assets

Training Infrastructure
Dedicated computing and storage for training and education

ISO 9001 Certified Quality Management System www.tuv-sud.com/ms-cert

ISO 20000 Certified IT Service Management System www.tuv-sud.com/ms-cert

- Workload Manager (DIRAC)
- Applications on Demand
- Notebooks

Core federation services
Federation fabric

Federated Compute Management

EGI Provider

Compute resources

Cloud Compute

High Throughput Compute

Storage Resources

Block Storage

Object Storage

File Storage

Federated Identity

Federated Data Management

- Data Transfer
- DataHub
- CVMFS

Discovery

Monitoring

Accounting

Software Distribution

Cloud Compute

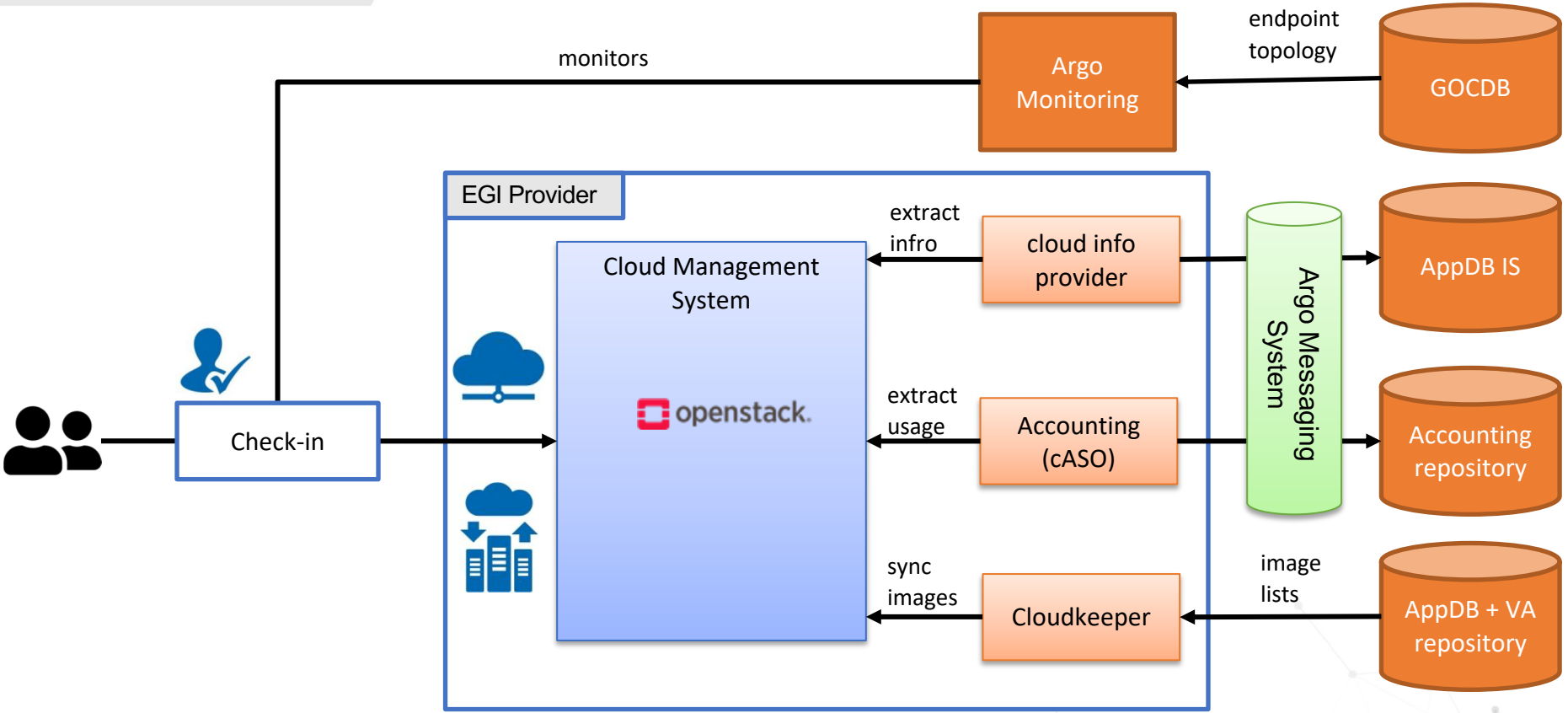
Distributed Infrastructure as a Service (IaaS) powered by the EGI Federated Cloud

- Allows international collaborations to perform distributed data analysis with VM-based workloads

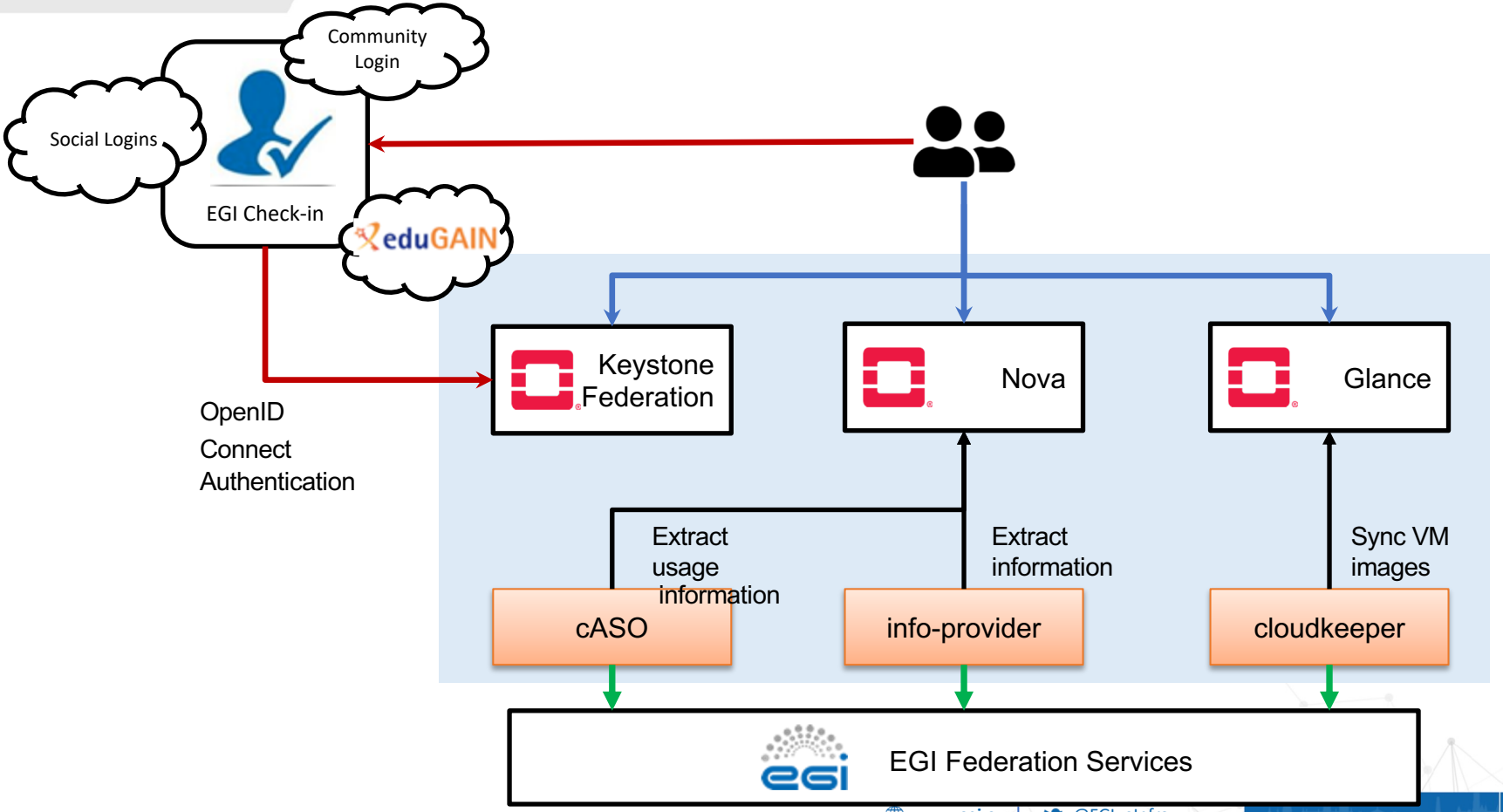
Features:

- Execution of VMs on a distributed infrastructure
- Federated identity
- Common VM image catalogue
- GUI and CLI/API based access
- Support for IaaS orchestration
- Central accounting and monitoring

Cloud Federation



Interaction with OpenStack



https://www.egi.eu/services/

EGI Service Catalogue

Compute

Cloud Compute
Run virtual machines on demand with complete control over computing resources

Cloud Container Compute
Run Docker containers in a lightweight virtualised environment

High-Throughput Compute
Execute thousands of computational tasks to analyse large datasets

Workload Manager
Manage computing workloads in an efficient way

Storage and Data

Online Storage
Store, share and access your files and their metadata on a global scale

Data Transfer
Transfer large sets of data from one place to another

DataHub
Access key scientific datasets in a scalable way

Security

Check-in
Login with your own credentials

Applications

Applications on Demand
Share online applications for your data and compute-intensive research

Notebooks
Create interactive documents with live code, visualisations and text

Training

FitSM Training
Learn how to manage IT services with a pragmatic and lightweight standard

ISO 27001 Training
Learn how to manage and secure information assets

Training Infrastructure
Dedicated computing and storage for training and education

ISO 9001
Certified
Quality Management System
www.tuv-sud.com/ms-cert

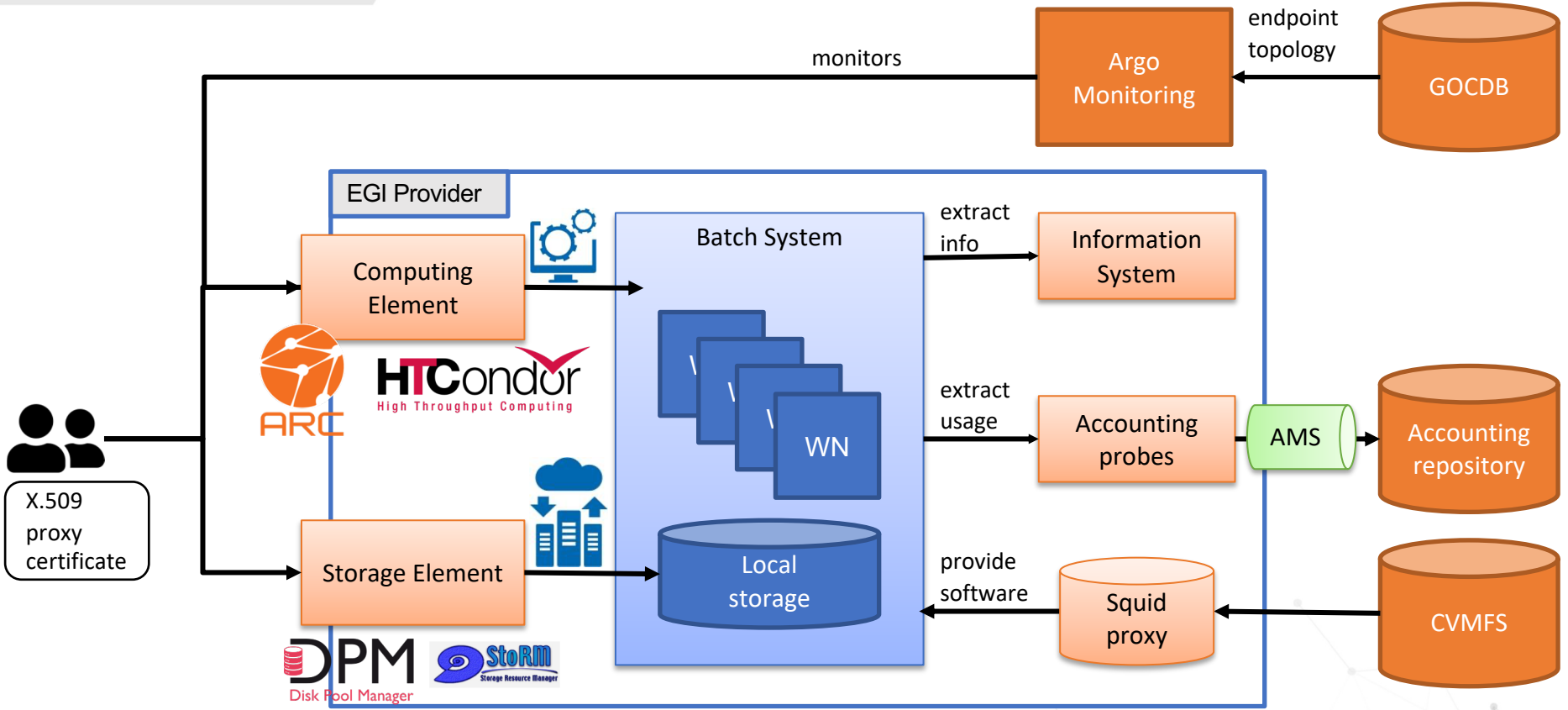
ISO 20000
Certified IT Service
Management System
www.tuv-sud.com/ms-cert

High Througput Compute

The EGI High-Throughput compute (HTC) provides users with the capability to access large amounts of computing resources, and to submit hundreds or thousands of computational tasks.

- Provides a uniform gateway interface to existing computing & storage systems
- Access based on VOs (Virtual Organisations) using X.509 certificates
- Software distribution based on CVMFS
- DIRAC Workload Manager for distributing jobs across several sites
- FTS moves data across sites

HTC Federation



https://www.egi.eu/services/

EGI Service Catalogue

Compute

Cloud Compute
Run virtual machines on demand with complete control over computing resources

Cloud Container Compute
Run Docker containers in a lightweight virtualised environment

High-Throughput Compute
Execute thousands of computational tasks to analyse large datasets

Workload Manager
Manage computing workloads in an efficient way

Storage and Data

Online Storage
Store, share and access your files and their metadata on a global scale

Data Transfer
Transfer large sets of data from one place to another

DataHub
Access key scientific datasets in a scalable way

Security

Check-in
Login with your own credentials

Applications

Applications on Demand
Share online applications for your data and compute-intensive research

Notebooks
Create interactive documents with live code, visualisations and text

Training

FitSM Training
Learn how to manage IT services with a pragmatic and lightweight standard

ISO 27001 Training
Learn how to manage and secure information assets

Training Infrastructure
Dedicated computing and storage for training and education

ISO 9001
Certified
Quality Management System
www.tuv-sud.com/ms-cert

ISO 20000
Certified IT Service
Management System
www.tuv-sud.com/ms-cert

Datahub

Transparent data access under a **common namespace** regardless of the location

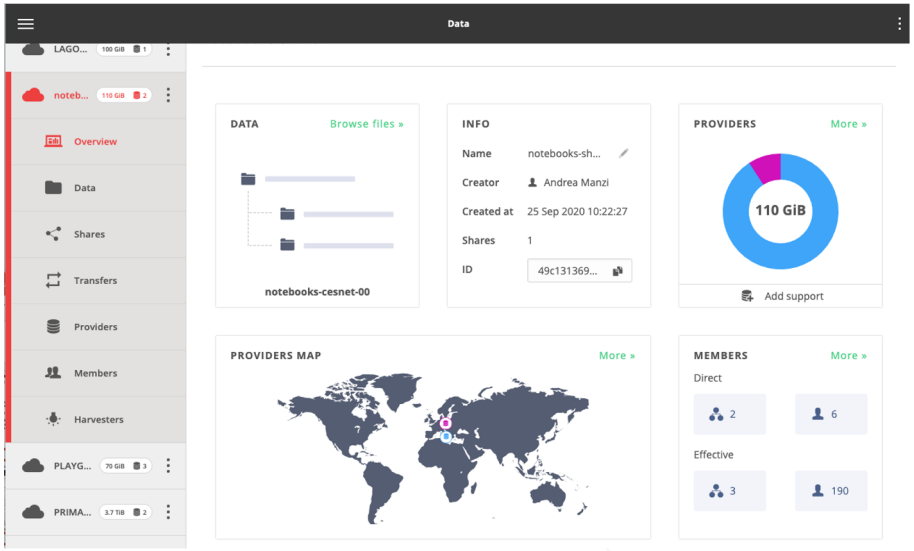
- open access or restricted to members of a Virtual Organization (VO)

GUI & API access

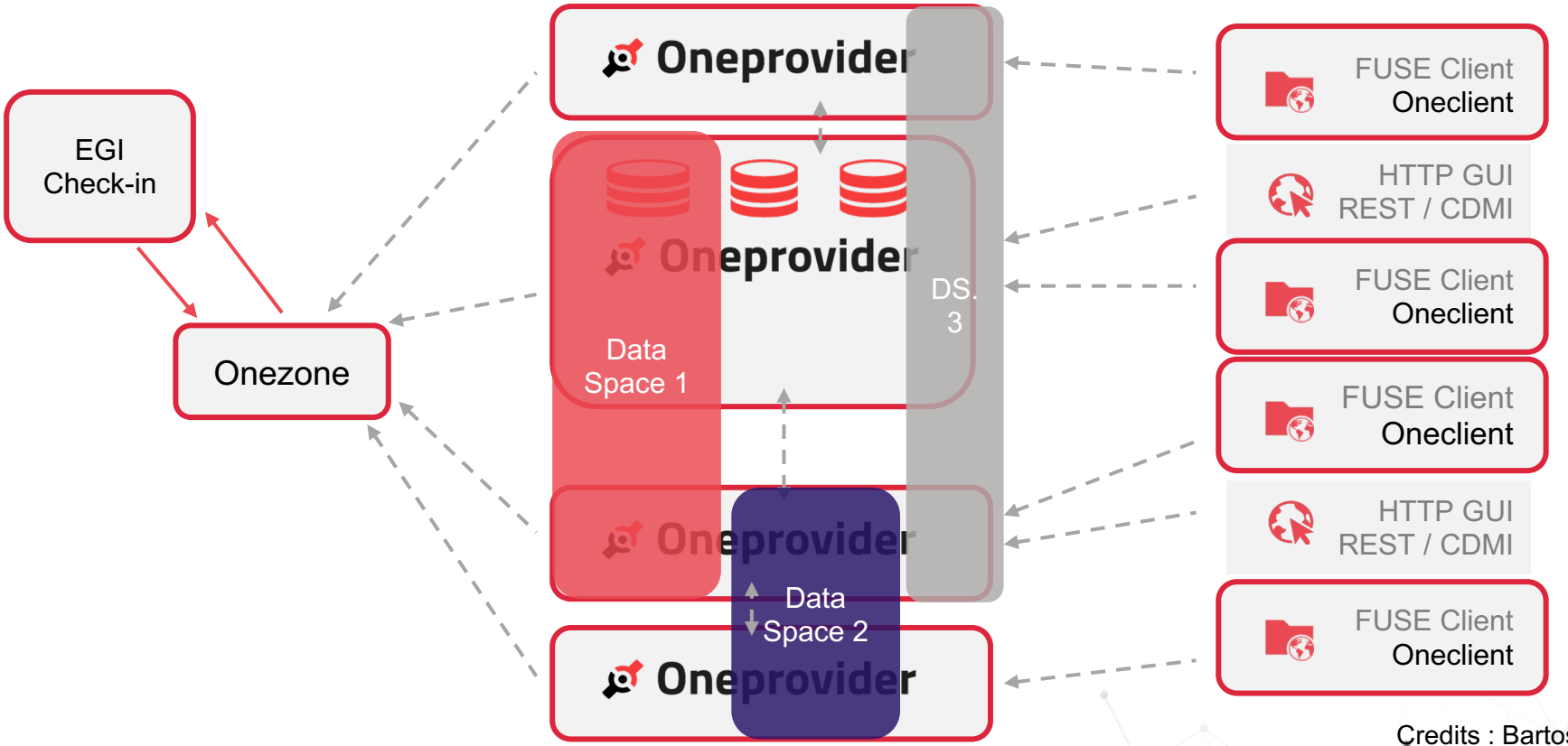
On demand/automatic replication of data

- Resiliency and availability

Easy integration with other EGI services thanks to use of **EGI Check-in**

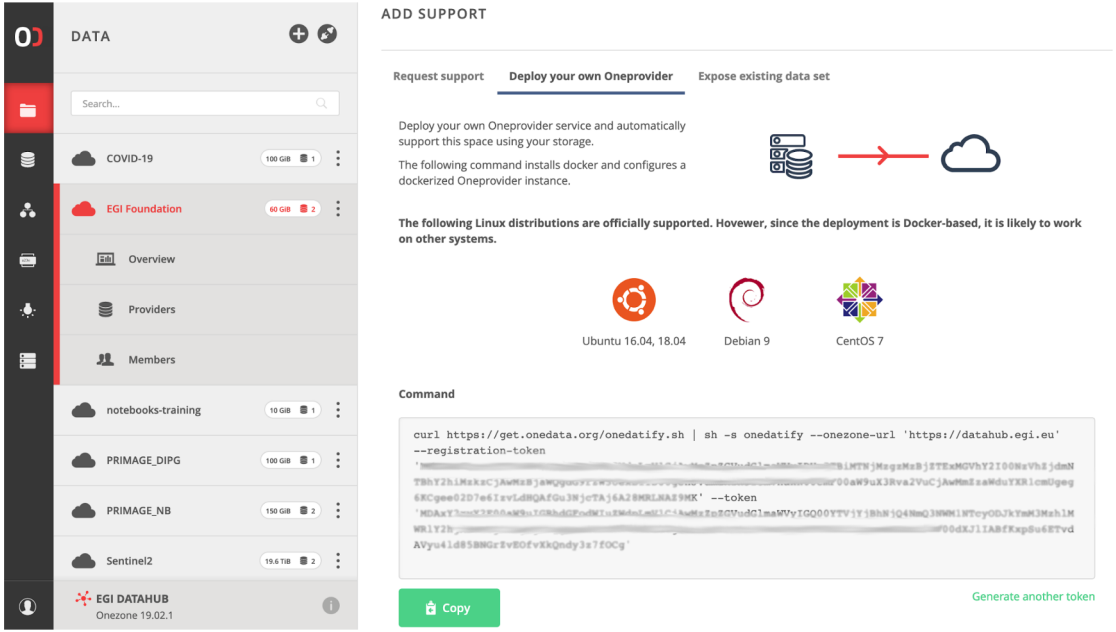


DataHub Architecture



Credits : Bartosz Kryza

DataHub integration

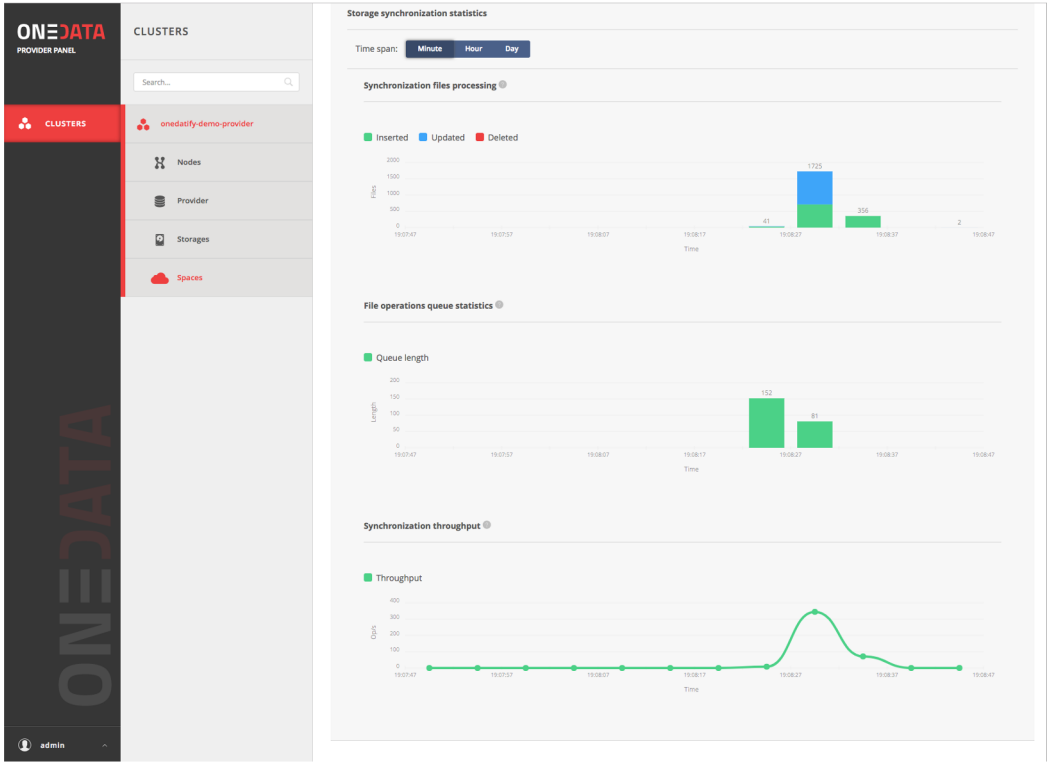


Automatic SSL certificate installation via Let's Encrypt

Supported backend

- Posix
- S3
- Swift
- CEPH
- GlusterFS
- NFS
- Webdav

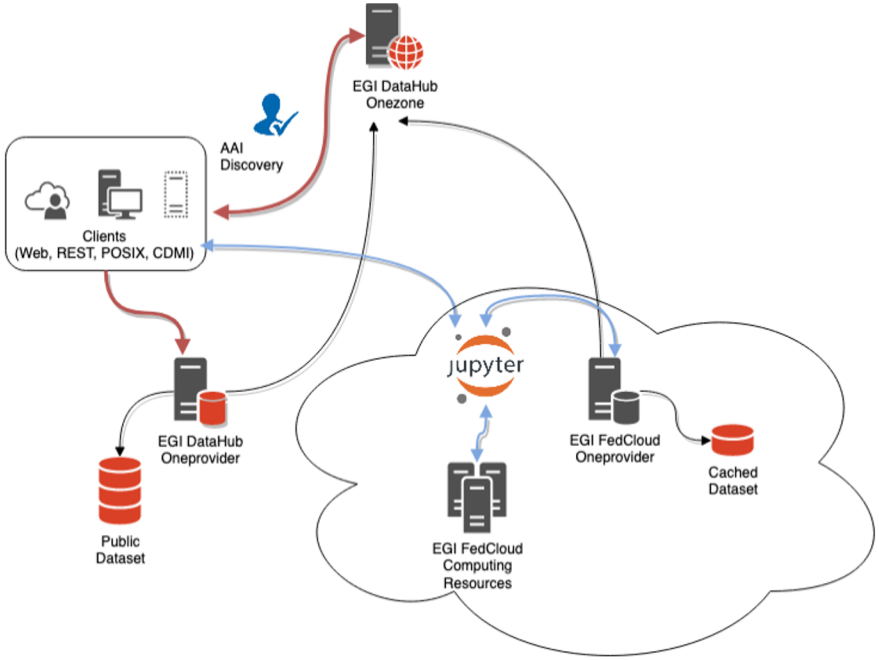
DataHub integration



One time import
Continuous Synchronization
Statistics available from the Oneprovider admin panel

Use case: Notebooks Datahub

- EGI Notebooks deployment includes a oneprovider with support to selected spaces
- Automatic setup of credentials and oneclient to access spaces as local files from the notebooks
- Also available via OnedataFS plugin (useful for Python specific code)



EGI-ACE HPC integration activities

Objective: Provide interoperability guidelines for HPC systems with the EOSC Compute Platform delivered by EGI-ACE

Explore the usage and integration of HPC guided by 4 scientific pilot use cases with combined cloud and HPC needs, focusing on the areas of:

1. Access federation: Federated Authentication and Authorization
2. Application federation: Portable execution of container-based workloads
3. Data federation: Data transfers between systems
4. Operation federation:
    - Presence in EOSC Portal, A/R monitoring, Usage accounting, Resource allocation, CRM

HPC integration pilots

4 use case pilots:

- **ELI-NP** (IFIN-HH): deployment of HPC-capable systems on IaaS clouds (HPC as a Service)
- **HEP** (CERN): benchmarking, data transfer and execution of codes using federated authentication
- **ENES** (CMCC): execute docker-based jobs accessing to DataHub on HPC
- **PROMINENCE** (UKAEA): facilitate running containerised workflows on HPC resources from the PROMINENCE service

4 HPC provider pilots:

Members of EuroCC and EGI Federation

CESGA Centro de Supercomputación de Galicia — Spain

TÜBİTAK — Turkey

IICT — Bulgaria

LIP — Portugal

Next Steps

Establish an MoU - sample tasks:

1. Coordinated delivery of cloud and user support:
   - Technical integration of cloud resources into EGI
   - Expose resources to EOSC
   - User support
2. Exchange applications and data
   - DataHub / AppDB integration and sharing
3. Impact of e-infrastructure services
   - Align and connect their customer relationship management (CRM) process

1. Create NGI: PROC02
2. Register site: PROC09
3. Technical integration

EGI: Advanced Computing for Research

www.egi.eu
@EGI_eInfra

Thank you
for your attention.

Questions?

This work by the EGI Foundation
is licensed under a Creative Commons Attribution 4.0 International License.

The work of the EGI Foundation
is partly funded by the European Commission under H2020 Framework Programme